Figure 1

Effect of larger and smaller helix pitch on the volume of liquid in the device

Cylinder walls

Helical baffle

Fluid

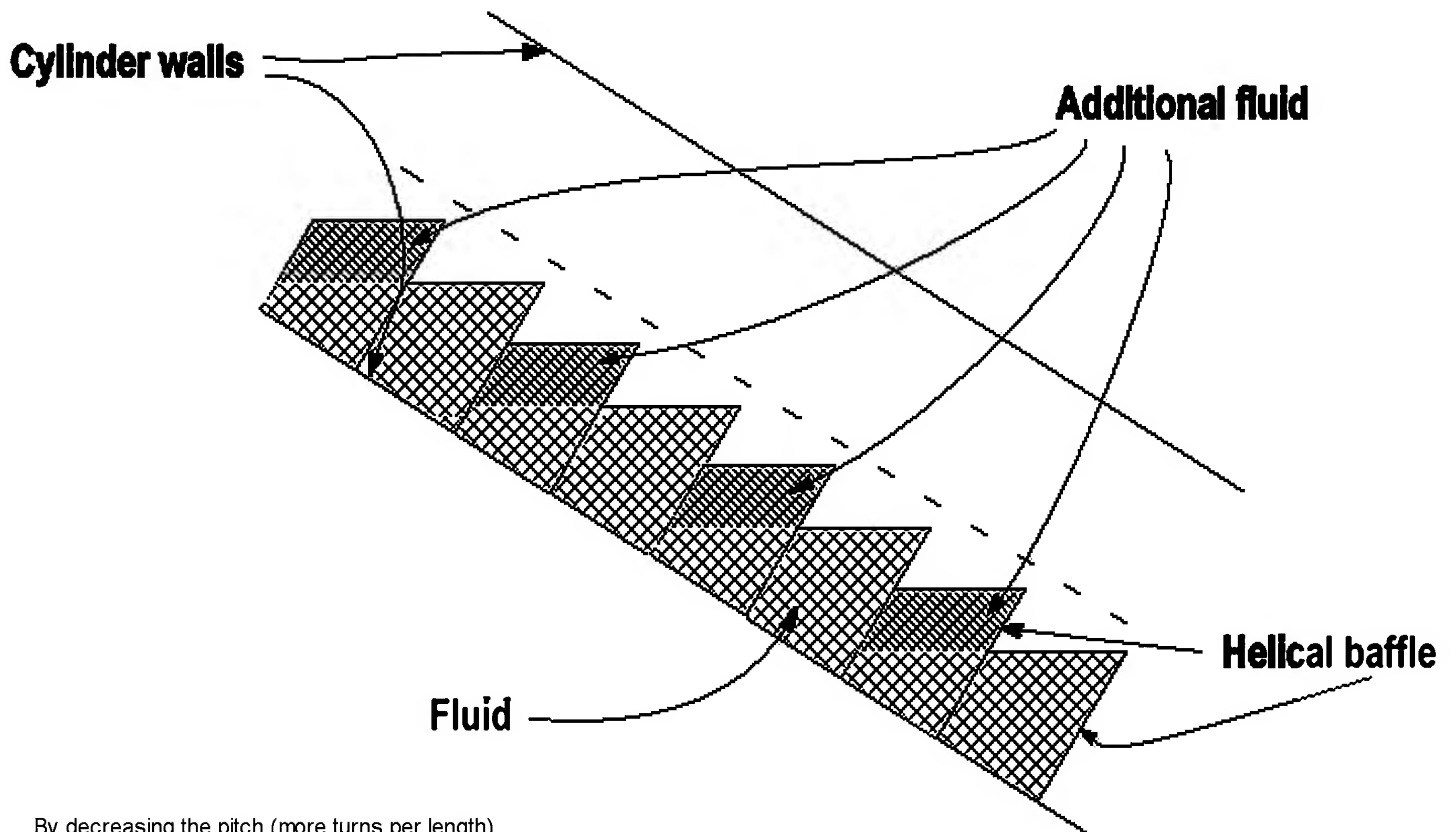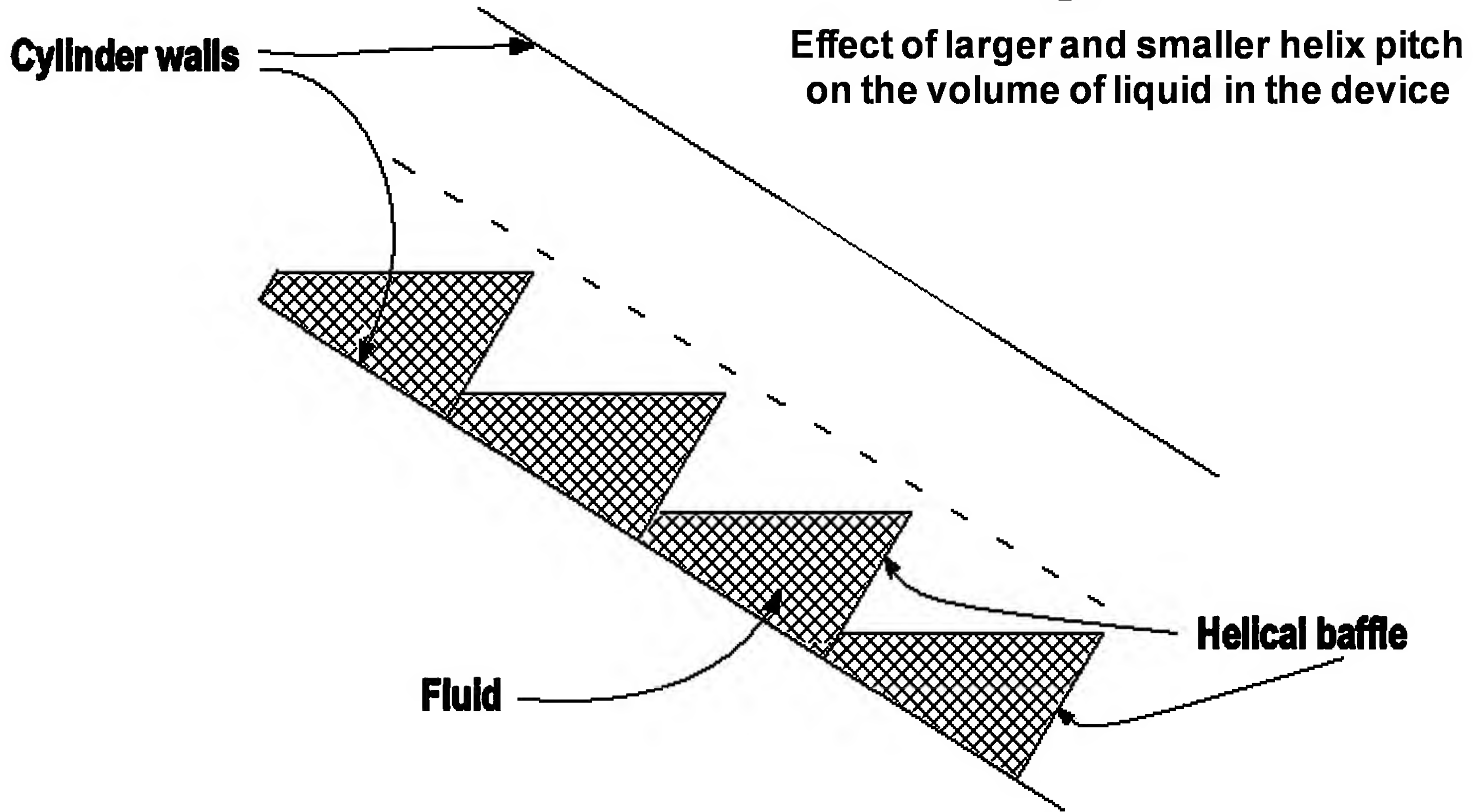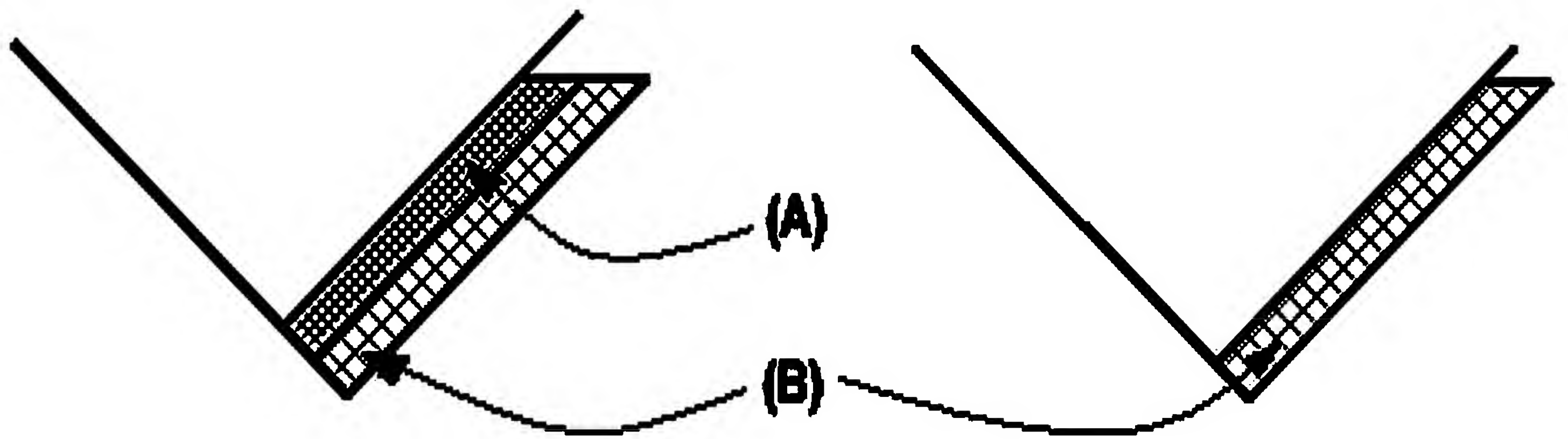**Cylinder walls**

Additional fluid

Helical baffle

Fluid

By decreasing the pitch (more turns per length) the amount of fluid for a given baffle crosss section is increased. The addition volume in the lower drawing w ith a smaller pitch is show n w ith a different hatch pattern.

The average potential energy of water spilled from a higher pitch helix is larger than a lower pitch. Proof is provided by showing that the additional fluid cross section (A) in a higher helix pitch will have a higher center of gravity than the common cross sections (B)

Figure 2

Effect of larger and smaller helix pitch on the spill effect at the exit of the device

Cylinder walls

Fluid

Helical baffle
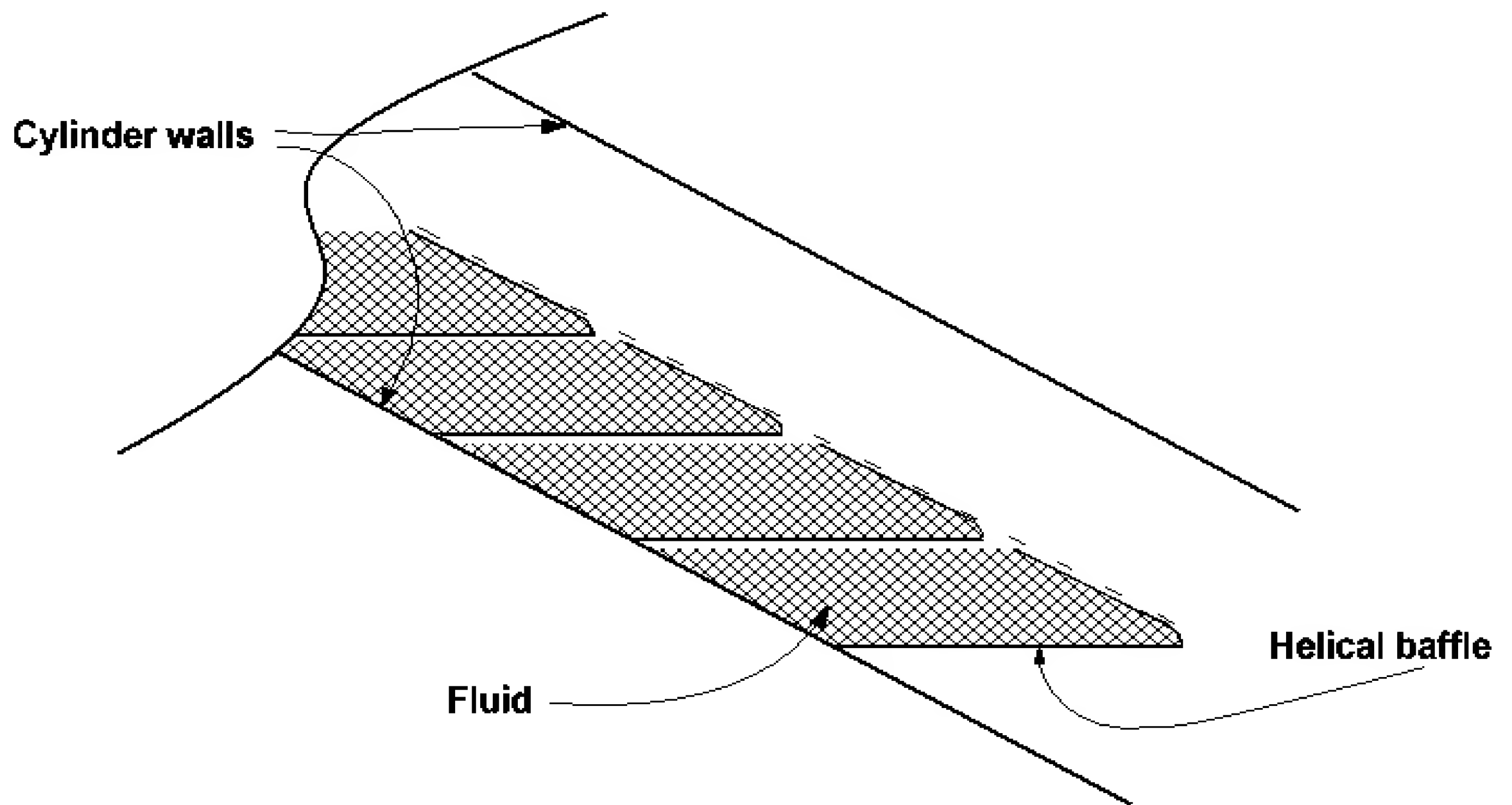
By varing the cross sectional design of the baffle, the amount of fluid contained housing can approch 1/2 the volume of the housing.
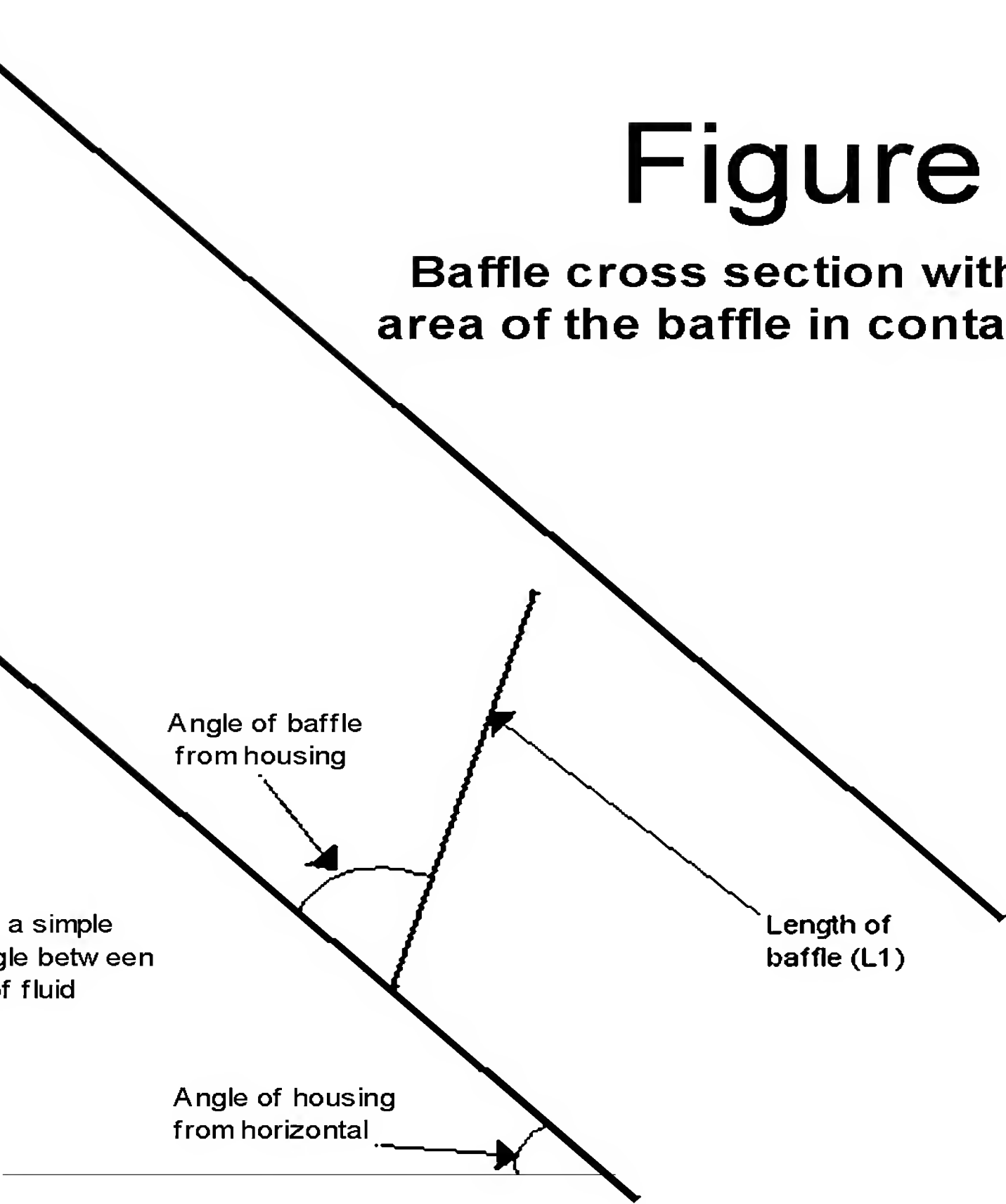
Figure 3

baffle cross section with a high volume of water captured in a helix turn
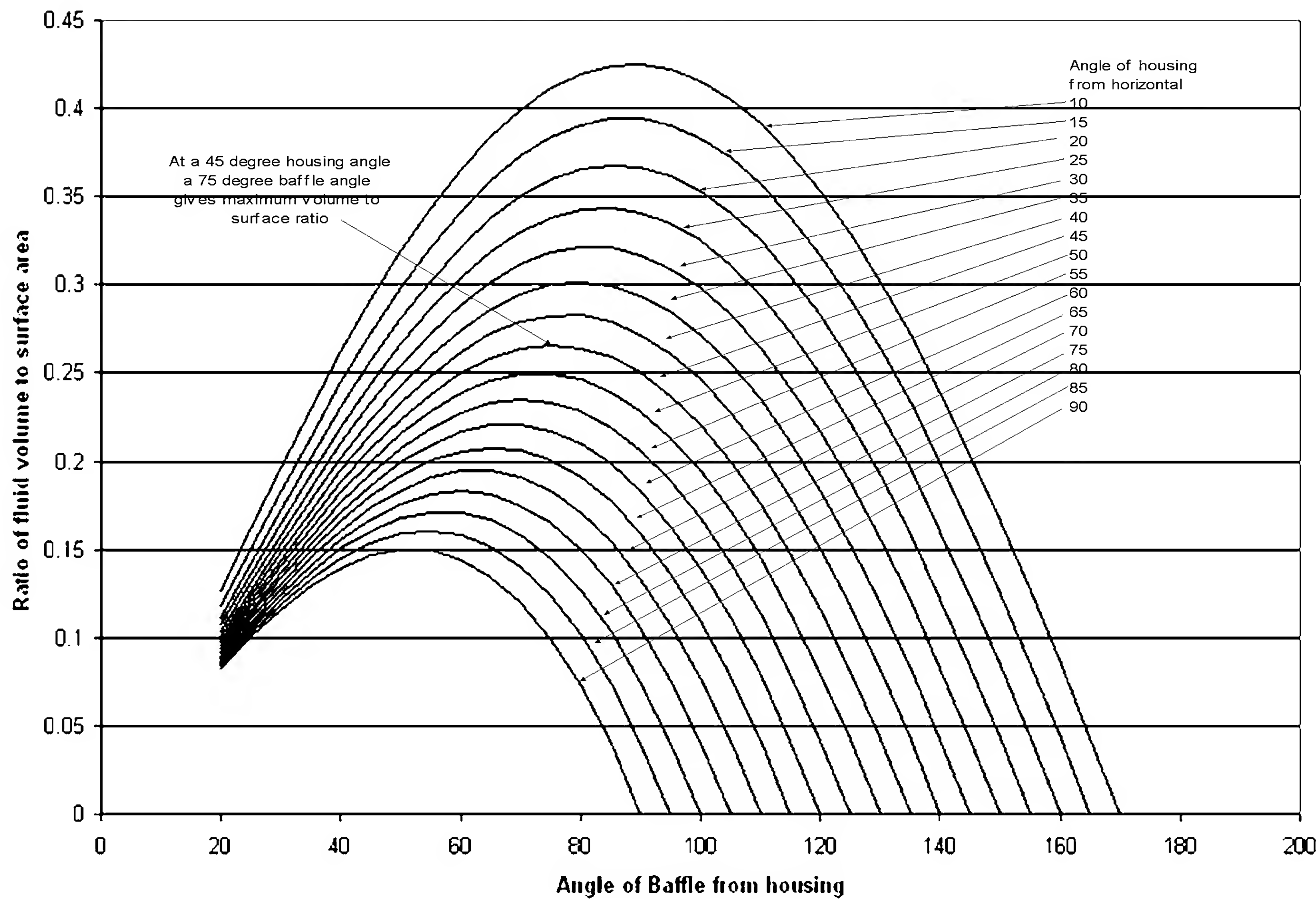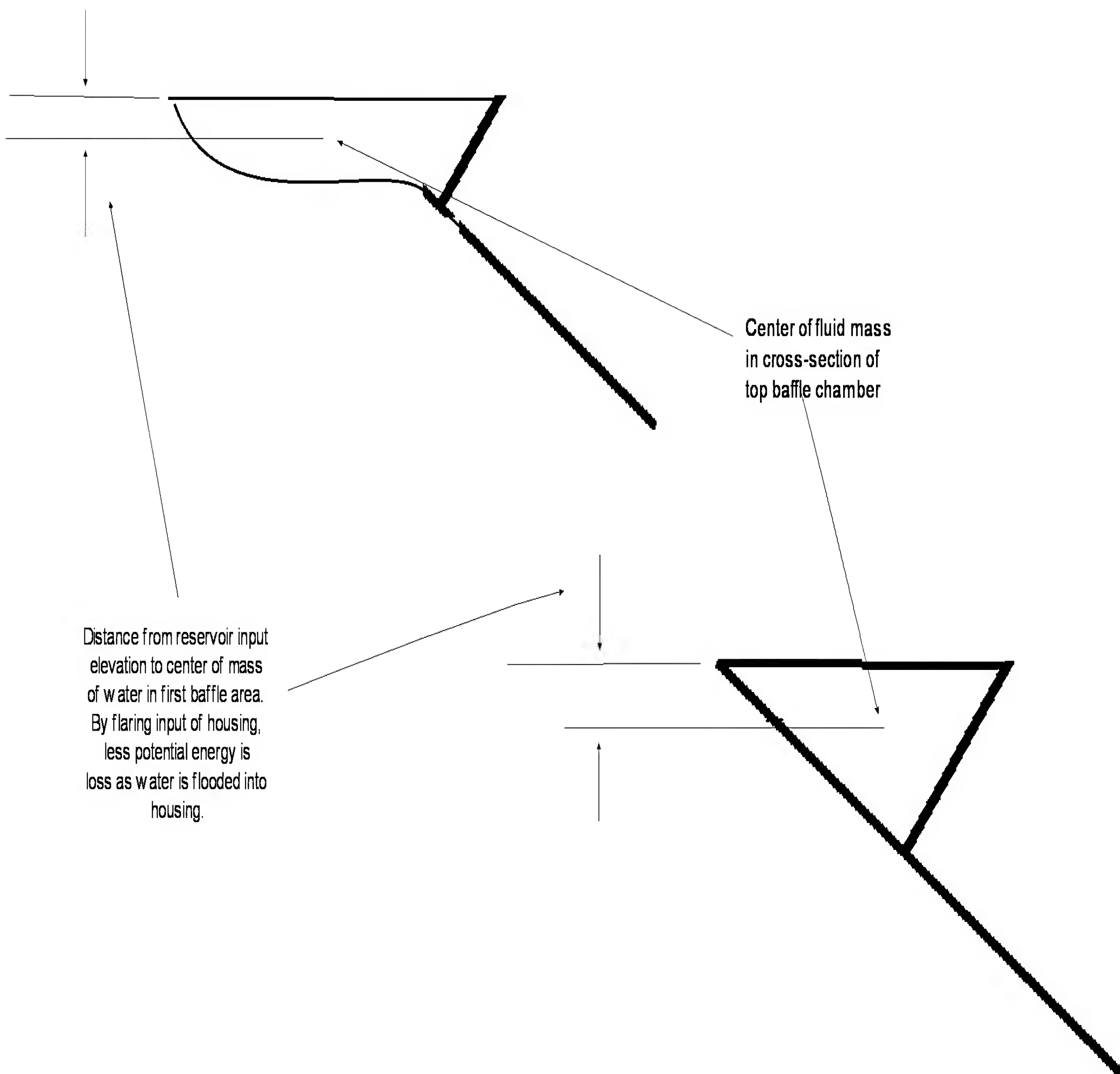
Figure 4

Baffle cross section with low surface area of the baffle in contact with the fluid

For a given housing angle from horizontal and a simple helix cross section there exists an optimal angle between the baffle and housing to mazimize the ratio of fluid volume to frictional surface

Angle of baffle from housing

Length of baffle (L1)

Angle of housing from horizontal

Effect of housing and baffle angles on volume to surface rationgles

At a 45 degree housing angle a 75 degree baffle angle gives maximum volume to surface ratio

Angle of housing from horizontal
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90

Ratio of fluid volume to surface area

Angle of Baffle from housing

Center of fluid mass
in cross-section of
top baffle chamber

Distance from reservoir input
elevation to center of mass
of water in first baffle area.
By flaring input of housing,
less potential energy is
loss as water is flooded into
housing.

Figure 5

**Effect of larger radius and helix pitch
at the entrance of the device**

Exit stream elevation

Center of gravity elevation
of last baffle chamber of
fluid
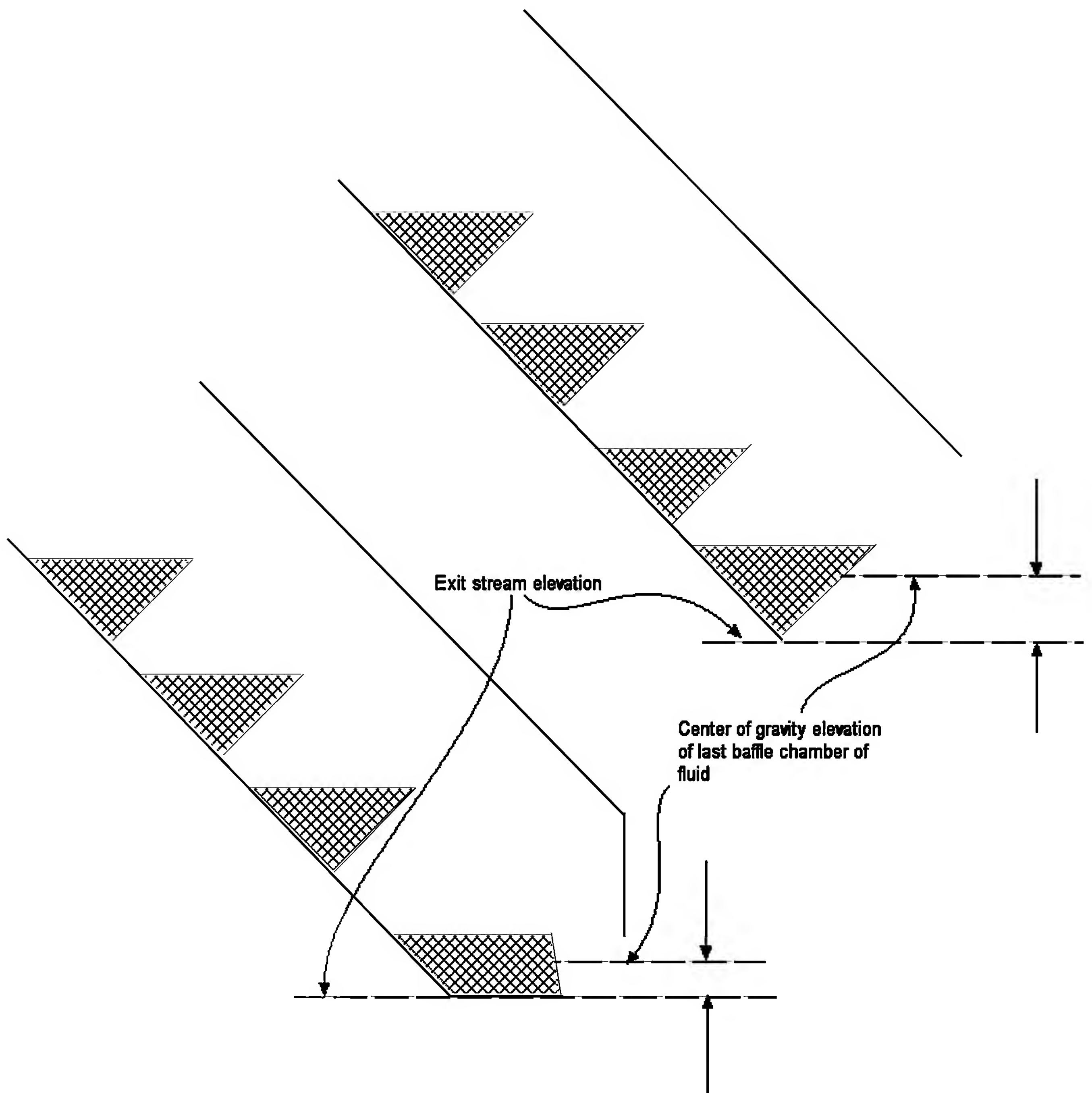
By flattening the exit baffle cavity, the center of gravity
of the exiting fluid is lowered prior to dumping and
thereby reduces the uncaptured potential energy when
the fluid is "spilled" to the exit stream

Figure 6

**Effect of larger radius and helix pitch
at the exit of the device**

Siphoning mechanism at entrance to device would allow for
flexibility in height of supply reservoir, simplification of fluid entry
configuration and the ability for the device to be located in a
position not directly adjacent to the supply reservoir.

.
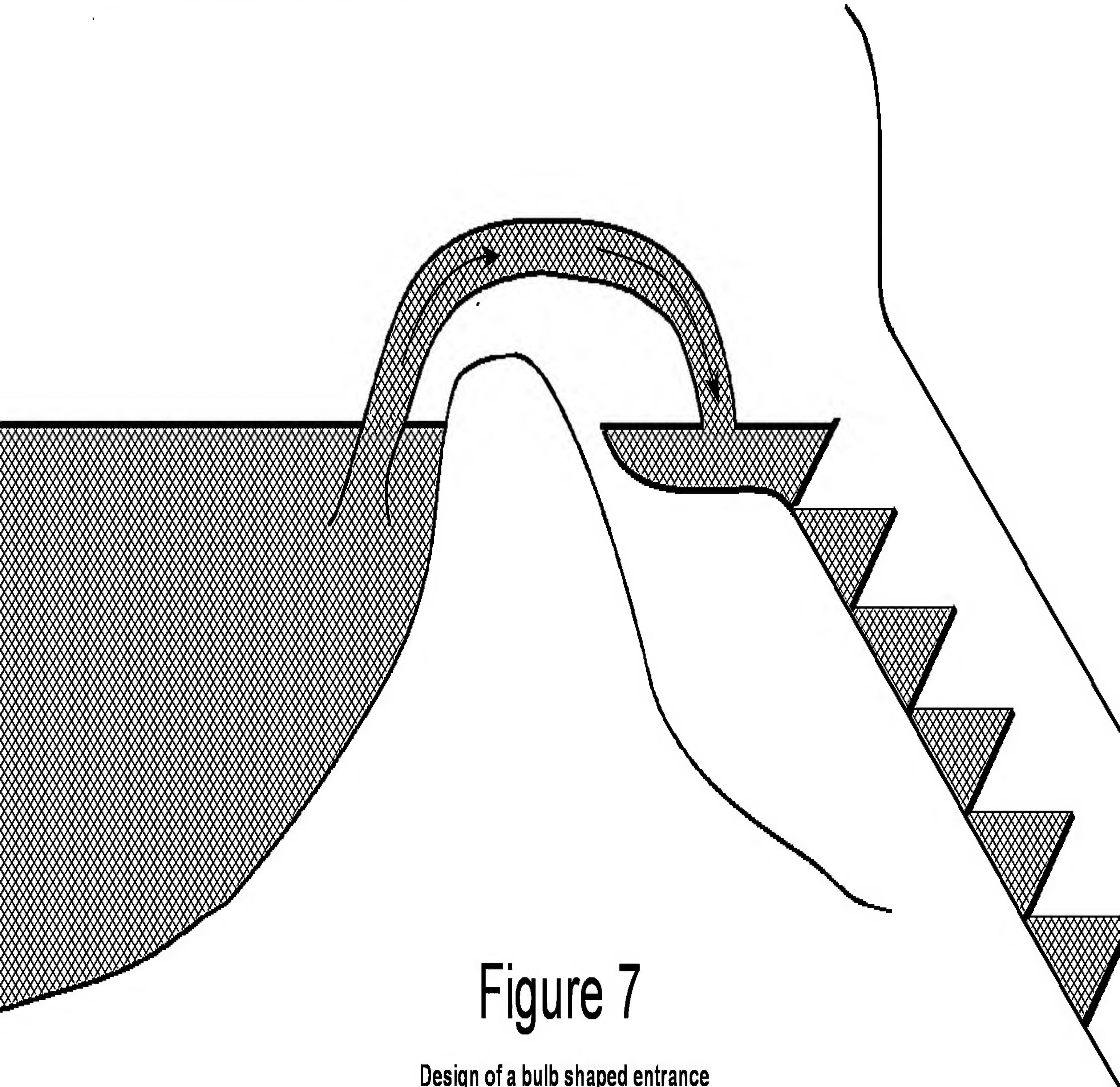
Figure 7

**Design of a bulb shaped entrance
utilized a siphon feed technique**

Sections of the housing and baffle can be added or removed to change the length of the device and thereby adjust the entrance elevation as needed based on the level of the supply reservour.
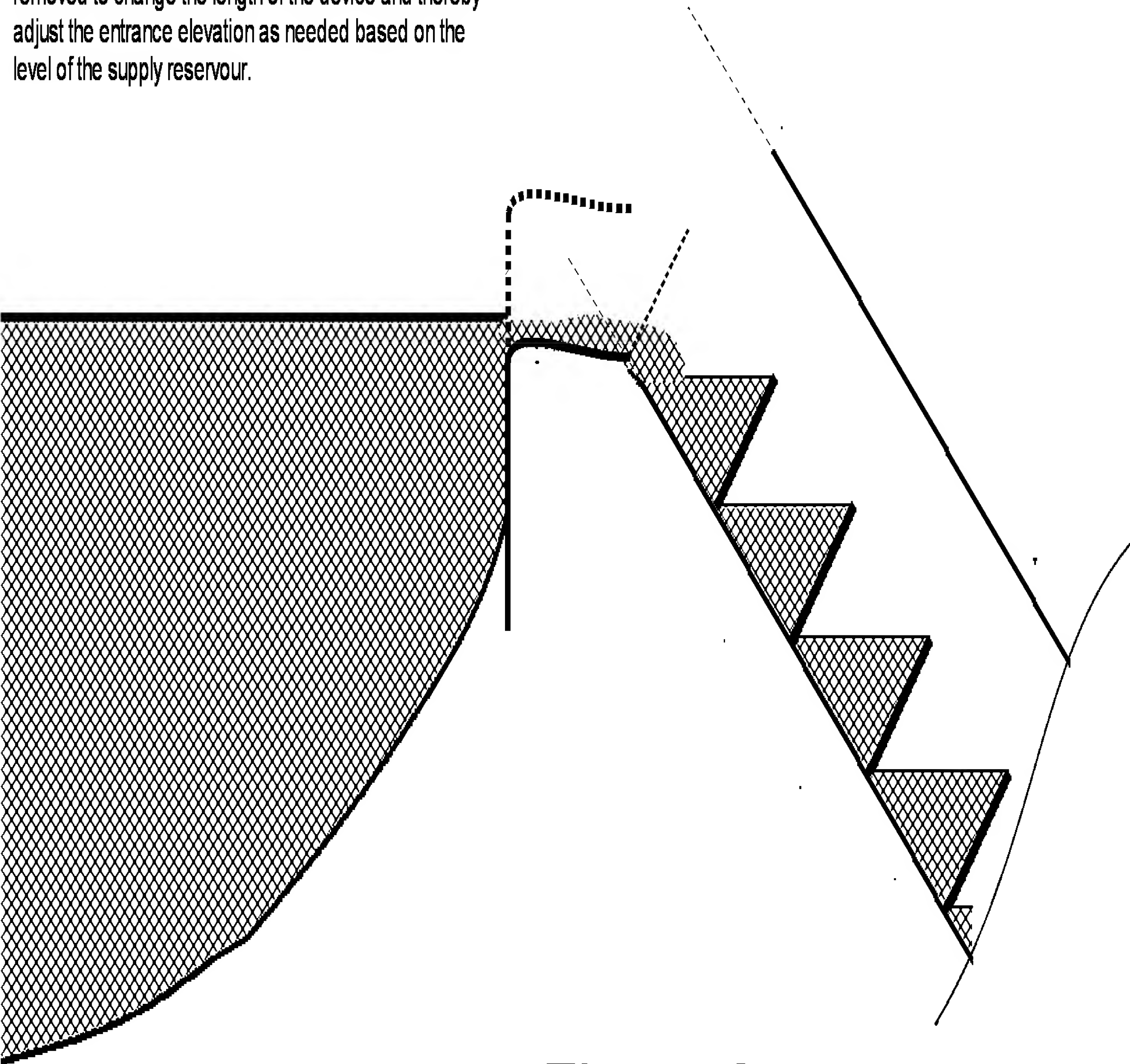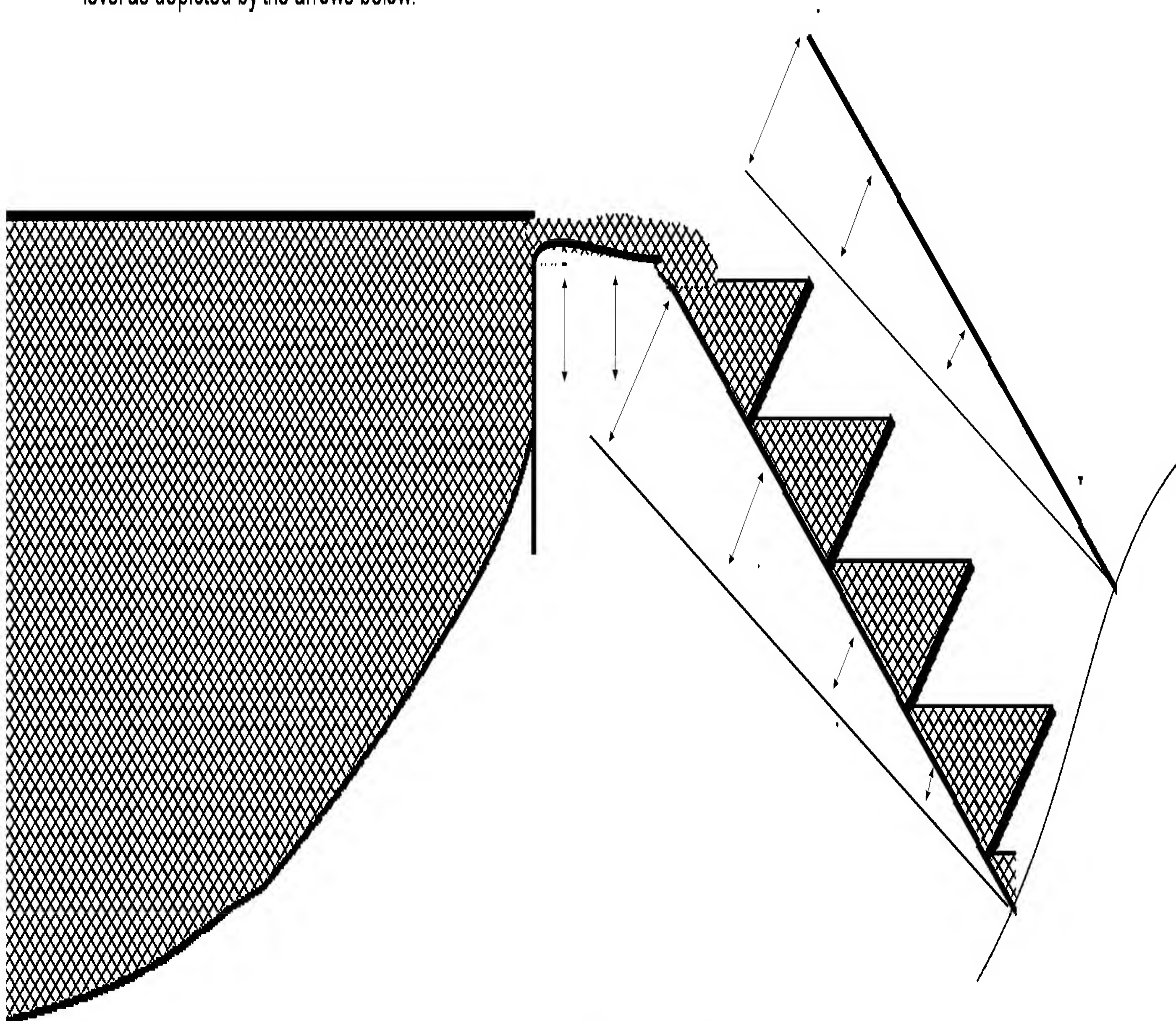
Figure 8

Change in input elevation via shortening or lengthening of the device

Changes in the elevation of the suppy reservour can be adjusted for
by changing the angle of the housing and adjusting the dam spill
level as depicted by the arrows below.

Figure 9

**Change in input elevation via changing
the angle of the device**

Reservoir

Power offtake and
electrical generation

Fluid

Exit Stream

Figure 10

Perspective view of AquaHelix device